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ABSTRACT

In 1985-86, a study was conducted to assess the instruction-related development needs of the faculty of South Carolina's two-year technical colleges. The study involved a survey of a sample of master teachers (N=120) in nine major discipline clusters at each of the system's 16 colleges to determine their perceptions of the instruction-related competencies needed by faculty. Subsequently, a second survey was conducted of 550 instructors and department heads at eight randomly selected colleges. Respondents were asked to rate their need for staff development in each of 66 identified competencies. Study findings, based on a 93.3% response rate to the first survey and a 78.7% response rate to the second, included the following: (1) all 63 competencies included in the first questionnaire plus an additional three competencies added by respondents were rated as either essential or desirable by at least 68.5% of the master teachers; (2) the competencies perceived to be most important dealt with instructional execution, management, and planning; (3) the majority of the respondents to the second survey felt that they had moderate, high, or great needs for developing 25 of the 66 competencies investigated; (4) most of these 25 competencies pertained to instructional execution, evaluation and planning, and program planning, development and evaluation; and (5) Engineering Technology faculty reported greater development needs than the faculty respondents in general with respect to the management and maintenance of instruments, equipment, and supplies for laboratory/shop courses; field trips; and supervision of student laboratory experiences. (AJL)

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INSTRUCTION-RELATED FACULTY DEVELOPMENT NEEDS IN A SYSTEM OF TWO-YEAR TECHNICAL COLLEGES

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Session 3250

Instruction-Related Faculty Development Needs In A System Of Two-Year Technical Colleges

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Introduction

Over the last 25 years, the state of South Carolina has developed a nationally and internationally recognized system of two-year technical colleges commonly known as the Tech System. Although called technical colleges, they exhibit the characteristics of community colleges throughout the nation. Many students are enrolled in Associate of Arts and Associate of Science transfer programs but most are in a broad array of occupationally oriented, technical and vocational programs, including engineering technology.

In recent years instruction has been provided by over 1100 full-time faculty members recruited largely from business and industry where they've acquired much of the technical knowledge and skills required in their areas of instruction. The teaching faculty form one of the most important and valuable resources of the Tech System and its individual institutions. Tech officials have long recognized that it is important to provide for the development of the faculty at institutional, regional, and state levels. During the last nine years special efforts and programs, such as Design for the Eighties and its resource centers, have focused attention on developing and updating faculty knowledge and skills in various high-technology subject areas.[1] Discipline and subject oriented development is certainly an essential part of faculty development.

Importance of Instruction-Related Development

An important and vital complement to subject-related development is the improvement of the faculty's instruction-related knowledge and skills. Regardless of how competent faculty members may be in possessing knowledge and skills pertaining to their subject areas, they must be able to provide instruction and other educational related activities in ways that are effective in communicating their knowledge and skills and developing them in their students. The possession of important instruction-related competencies by members of the faculty can substantially help students develop and achieve their educational goals.

Additionally, Tech institutions enroll many nontraditional students, over age 25, who as consumers of educational services tend to evaluate more seriously the quality of instructional services delivered to them. The faculty's possession of discipline-related competencies alone, apart from adequate instruction-related competencies, will not satisfy these students nor many of today's traditionl students. Furthermore, teaching is the dominant mission and primary function of two-year colleges; it is the first and major responsibility of their faculty; and, excellence in education is largely the consequence of their talents and performances.[2,3,4,5]

Need for Assessment of Instruction-Related Skills Within the Tech System

It has appeared that within the Tech System the main thrust of most faculty development activities and standards for employment has been on the development of and possession of discipline-related knowledge and skills. The development of instruction-related competencies seemed to have been given secondary consideration. Since Tech's faculty members have greatly varying levels of formal education, and many were employed directly from business and industry and entered classrooms with little pedagogical skills, it was important that increased attention be given to instruction-related faulty development needs. Such efforts should begin with an assessment of the needs so that development resources and activities can be used and directed in an effective manner.

Recognizing the importance of knowing the development needs of faculty when making and updating plans for their development, the author undertook a study, during the 1985-86 school year, to assess some of the instruction-related development needs of Tech's teaching faculty. Preceeding the needs assessment another part of this study determined what instruction-related competencies were important to outstanding members of Tech's teaching faculty. Investigated in the study also were how the importance of these competencies and the need for their development varied with faculty subject area, level of education, length of teaching experience, age, sex, and other factors. This paper describes only a portion of the study and its findings. It focuses on the findings concerning the instruction-related development needs of the

faculty, in general, and the engineering technology faculty among them. Differences between the needs for all the faculty and the engineering technology faculty are examined, also. A complete report of the study and findings concerning all Tech's faculty, without special attention to engineering technology faculty, was recently made available.[6]

Methodology

The study was concerned with the population of approximately 1100 full-time teaching faculty employed in the 16 colleges of the Tech System during the Fall and Winter Quarters of the 1985-86 school year. Two questionnaires were utilized to gather the information needed to respond to four research questions concerning what instruction-related competencies were important, which of them the faculty needed to develop, and whether the importance of the competencies and the need for their development varied with 10 variables.

The first questionnaire was designed to determine what instruction-related competencies were important to a sample of master teachers, one in each of nine major discipline clusters at each of the 16 colleges. The discipline clusters included Agricultural Technology, Arts and Sciences, Business Technology, Computer Technology, Engineering Technology, Health Science, Industrial Technology, Public Service, and Developmental Studies.

Nearly all of the 63 competency statements in the first questionnaire (See Items 1-63 in Table 1) were drawn from, or based on, the Vocational Teacher Competency Profile developed by the Center for Vocational Education of Ohio State University.[7] The first questionnaire was mailed in August, 1985 to 120 master teachers who were asked to rate each competency Essential, Desirable, or Unnecessary. After two follow-ups, 112 (93.3%) completed questionnaires were returned.

All 63 of the competences were found to be important (rated Desirable or Essential by the majority of the respondents) and therefore, were included in the second questionnaire which was designed to assess instruction-related development needs of Tech's teaching faculty. Open-ended comments from the first questionnaire resulted in the inclusion of three additional competency statements in the second questionnaire (Items 64, 65, and 66 in Table 1). The second questionnaire was mailed to a sample of 550 instructors and department heads consisting of all the full-time teaching faculty in eight randomly selected Tech institutions stratified by institutional size (large, medium, and small). The response rate was 78.7% and the respondents were found to be adequately representative of the sample and the population. The respondents specified their need for development (Great, High, Moderate, Little, or None) in each of the 66 competencies listed in the questionnaire.

The information received in response to the two questionnaires was analyzed using the Statistical Analysis System (SAS). The competencies were rank ordered by importance and need for development. The chi-square test was employed to test for statistically significant differences ($p < .05$) in the importance of the competencies and in the need for developing the competencies by faculty subject area, level of education, length of teaching experience, age, sex, and other factors.

Summary of Findings

Importance of the Competencies

All 63 competencies included in the first questionnaire were perceived to be important to Tech master teacher respondents. Each competency was rated either Essential or Desirable by at least 68.5% of the 112 respondents. Thirty-eight of the competencies were rated Essential by the majority of the master teachers as shown in the second column of Table 1. Three additional competencies, Items 64, 65, and 66, were considered important, too, based on a summary of open-ended comments of the master teachers. Most of the added comments indicated concerns for human relations, professional role, and keeping up to date in discipline areas. Competencies perceived to be most important dealt with instructional execution, instructional management, and instructional planning. These findings were found to support those of several previous investigators.[8,9,10,11]

Need for Developing the Competencies

All Faculty. The majority of all faculty responding to the second questionnaire perceived Moderate, High, or Great need for developing 25 of the 66 competencies. These competencies are the first 25 listed in Table 1, in rank order of need for development. Most of these 25 competencies pertained to the following general categories: (a) Instructional Execution - Competencies 18, 3, 17, 11, 31, and 37; (b) Instructional Evaluation - Competencies 2, 30, 8, 10, and 9; (c) Instructional Planning - Competencies 58, 62, 5, and 6; and, (d) Program Planning Development and Evaluation - Competencies 46, 48, 52, and 59.

Sixteen of these competencies which the majority needed to develop had been rated Essential by the majority of master teachers as indicated in Table 1. The first seven competencies listed in the table needed to be developed by two-thirds or more of all respondents.

The relationship between the importance of the 38 competencies rated Essential by the majority of master teachers and the faculty's need to develop them was examined by plotting the rank order of importance of the competencies, from Table 1, against their relative rank order (among the 38 competencies) in Moderate to Great

Table 1
Rank Order of Competencies by Importance and Need for Development

Instruction-Related Competencies[a]	Rank by Importance[b]	Perceived Need for Development - Moderate, High, or Great					
		All faculty respondents (n = 422-433)			Engineering technology faculty respondents (n = 38-40)		
		Rank Order	Percent Respondents	≥ 50% Respondent	Rank Order	Percent Respondents	≥ 50% Respondent
18. Accommodate the instructional need of students with different ability levels.(C)	30	1	74.0	x	2	77.5	x
61. Demonstrate appropriate levels of computer literacy and operational and programming skills.(I)	-	2	72.5	x	11	60.0	x
58. Provide activities to accommodate different styles of learning.(B)	38	3	70.6	x	7	65.0	x
2. Evaluate your instructional effectiveness.(D)	11	4	70.2	x	3	75.0	x
3. Guide students in applying problem-solving techniques.(C)	2	5	69.9	x	4	67.5	x
46. Identify needed program improvements through program evaluation.(A)	4	6	67.5	x	5	67.5	x
62. Perform an instructional needs analysis.(B)	-	7	66.9	x	16	59.0	x
44. Aid students in developing educational and career goals.(F)	27	8	64.4	x	10	63.1	x
64. Up-to-date knowledge and skills in subject area.(I)	-	9.5	61.9	x	1	77.5	x
30. Assess student attitudes in relation to objectives by using various tests.(D)	-	9.5	61.9	x	12	60.0	x
56. Arrange for procuring special items for academic program.(E)	21	11	61.1	x	6	65.0	x
5. Determine needs of students.(B)	12	12	59.2	x	27	50.0	x
8. Establish and promulgate student performance criteria.(D)	7	13	58.2	x	19	57.5	x
17. Employ reinforcement techniques.(C)	17.5	14	58.1	x	8	65.0	x
6. Determine interests of students.(B)	-	15	57.7	x	14	60.0	x
57. Project future needs for supplies, equipment, books, etc.(E)	17.5	16	57.5	x	33	50.0	x
48. Develop program goals and objectives.(A)	5.5	17	56.4	x	15	60.0	x
59. Conduct a student follow-up study.(A)	-	18	54.3	x	17	57.5	x
52. Analyze an occupation to determine content and objectives for purposes of instruction.(A)	23	19	54.0	x	23	52.5	x
10. Assess student skills in relation to objectives.(D)	14	20	53.7	x	21	55.0	x
11. Introduce a lesson (so as to develop student interest and specify its place in the context of the course).(C)	21	21	53.7	x	9	65.0	x
9. Assess student knowledge in relation to objectives by using various tests.(D)	13	22	53.3	x	26	50.0	x
31. Employ simulation techniques.(C)	-	23	52.9	x	18	57.5	x
37. Stimulate learning by using brainstorming and/or buzz group techniques.(C)	-	24	52.7	x	32	50.0	x
55. Arrange for expanding/renovating facilities.(E)	-	25	52.1	x	38	45.0	

(table continues)

Instruction-Related Competencies[a]	Rank by Importance[b]	Perceived Need for Development - Moderate, High, or Great					
		All faculty respondents (n = 422-433)			Engineering technology faculty respondents (n = 38-40)		
		Rank Order	Percent Respondents	≤ 50% Respondent	Rank Order	Percent Respondents	≤ 50% Respondent
40. Employ the team teaching approach.(C)	-	26	49.8		20	55.3	x
50. Provide appropriate guidance to students in the effective use of texts, references, information/assignment sheets.(C)	10	27	48.8		24	52.5	x
1. Demonstrate a concept or principle.(C)	3	28	48.0		22	55.0	x
20. Write student performance objectives.(B)	36	29	47.0		39	45.0	
16. Employ oral questioning techniques.(C)	29	30	46.2		30	50.0	x
51. Assist students in applying for employment or further education.(F)	-	31	45.8		13	60.0	x
33. Use subject matter experts to present information.(C)	-	32	44.5		25	52.5	x
26. Lead group discussions.(C)	-	33	44.4		46	37.5	
12. Select and obtain instructional materials such as texts, references, etc.(B)	15	34	42.8		34	47.5	
36. Conduct panel discussions.(C)	-	35	42.6		45	40.0	
47. Conduct conferences with students.(F)	24.5	36	42.0		57	32.5	
24. Use models or real objects to illustrate concepts, principles, techniques, etc.(C)	32.5	37	41.6		31	50.0	x
7. Prepare instructional materials such as assignment sheets, handouts, etc.(B)	16	38	40.4		37	45.0	
41. Present information with televised and videotaped materials.(C)	-	39	39.6		35	46.2	
54. Maintain a filing system for records, grades, etc.(E)	19	40	39.3		43	40.0	
45. Formulate and maintain standards of student behavior in class or lab/shop.(E)	5.5	41	38.8		55	35.0	
49. Organize laboratories/shops for effective use.(E)	24.5	42	38.4		29	50.0	x
14. Present information through lecture or illustrated talk.(C)	28	43.5	38.3		47	37.5	
39. Utilize programmed instruction.(C)	-	43.5	38.3		52	35.9	
32. Supervise student presentations.(C)	-	45	37.6		51	35.9	
25. Demonstrate occupational skills.(C)	35	46	37.2		36	45.0	
66. Serve as a role model in the occupation you teach.(I)	-	47	36.5		41	41.0	
23. Plan a unit of instruction.(B)	9	48	35.8		40	42.5	
34. Illustrate with exhibits and bulletin boards.(C)	-	49	35.4		44	40.0	
60. For laboratory/shop courses manage and maintain instruments, equipment, and supplies.(E)	22	50	35.1		28	50.0	x
65. Demonstrate a genuine interest in students, friendly to them, relate to them as individuals.(F)	-	51	34.9		54	35.0	
13. Summarize a lesson--capsulize the major points presented.(C)	34	52	33.6		58	32.5	

(table continues)

Instruction-Related Competencies[a]	Rank by Importance[b]	Perceived Need for Development - Moderate, High, or Great					
		All faculty respondents (n = 422-433)			Engineering technology faculty respondents (n = 38-40)		
		Rank Order	Percent Respondents	≤ 50% Respondent	Rank Order	Percent Respondents	≤ 50% Respondent
35. Write a lesson plan.(B)	32.5	53	32.7		60	32.5	
27. Supervise individualized instruction.(C)	-	54	32.5		59	32.5	
63. Establish and uphold personal professional philosophy including ethical standards.(I)	1	55	32.0		65	25.0	
21. Present information with overhead projector.(C)	-	56	31.6		53	35.0	
43. Conduct field trips.(C)	-	57	29.2		42	40.0	
15. Supervise students in completing class and lab/shop projects.(C)	26	58	29.1		49	37.5	
28. Present information with filmstrips and/or slides.(C)	-	59	28.4		48	37.5	
4. Determine student grades.(D)	20	60	28.2		56	35.0	
19. Present information with chalkboard.(C)	-	61	28.1		64	27.5	
29. Present information with films.(C)	-	62	28.0		61	30.0	
22. Supervise student laboratory experiences.(C)	31	63	26.9		50	37.5	
53. Provide for student safety.(E)	8	64	24.8		62	27.5	
42. Present information by using flip charts.(C)	-	65	23.9		66	20.0	
38. Present information with tape recordings and/or records.(C)	-	66	23.8		63	27.5	

[a]Competencies are listed by item number in rank order of the sum of percentage of Moderate, High, and Great ratings (% Moderate + % High + % Great). Following each competency statement the competency type (category) is given by the letter in parenthesis indicating:

A - Program Planning, Development, and Evaluation;
B - Instructional Planning;
C - Instructional Execution;
D - Instructional Evaluation;
E - Instructional Management;
F - Guidance; and,
I - Professional Role and Development

[b]Rank order by importance for 38 of the competencies rated Essential by the majority of master teacher respondents (n = 112). Rank based on the percent Essential ratings.

need for development. Figure 1 shows the resulting plot (see round dots). Competencies closer to the upper right corner of the plot having higher rankings in both importance and need for development, should be considered first for faculty development within Tech. If rank by importance and rank by need for development are taken to be of equal concern, the competencies should be considered for development in the order of their nearness to the upper right corner (1,1 coordinate) of the grid in Figure 1. With these assumptions, the 16 competencies rated Essential by the majority of master teachers, out of the 25 which the majority of the faculty needed to develop, would be considered for development in the following order: 3, 46, 2, 8, 48, 5, 10, 17, 57, 9, 11, 52, 44, 18, 56, and 58.

Competencies 64, 65, and 66, not included in the importance ratings, do not appear in Figure 1. However, they were found to be important on the basis of open-ended comments and should not be overlooked in planning for faculty development. Likewise, the nine other competencies which the majority of the faculty needed to develop are not reflected in Figure 1 and should not be overlooked.

Engineering Technology Faculty. Forty (9.2%) of the 433 respondents were Engineering Technology faculty. Their needs for developing the competencies are listed in Table 1, also. Half or more of the engineering technology respondents perceived Moderate, High, or Great need for developing 33 of the 66 competencies. Each of these is marked with an "x" in the right most column of Table 1. Twenty-two of the 33 competencies had been rated Essential by the majority of master teachers, and five of the 33 needed to be developed by at least two-thirds of the engineering technology respondents.

Most of the competencies which half or more of the Engineering Technology faculty needed to develop belong to two general categories: (a) Instructional Execution - Competencies 18, 3, 17, 11, 31, 37, 40, 50, 1, 16, 33, and 24; and (b) Instructional Evaluation - Competencies 2, 30, 8, 10, and 9.

The relationship between the importance of the 38 competencies rated Essential by the majority of master teachers and the Engineering Technology faculty's need to develop them was examined by plotting the rank order of importance of the competencies, from Table 1, against their relative rank order (among the 38 competencies) in Moderate to Great need for development. Figure 1 shows this plot, also (see square dots). The square dots in Figure 1 have competency identification numbers the same as the round dots at the same ordinate-rank of importance. As stated before, competencies closer to the upper right corner of the plot should be considered first for faculty development. Thus, the 22 competencies rated Essential by the majority of master teachers, out of the 33 which half or more of Tech's engineering technology respondents needed to develop, should be considered for development in the following order: 3, 46, 48, 2, 8, 1, 50, 18, 17, 5, 9, 11, 52, 57, 60, 44, 49, 18, 16, 56, 24, and 58.

Again, Competencies 64, 65, and 66, not included in the importance ratings, do not appear in Figure 1. However, they were found to be important, too, as stated above and should not be overlooked in planning for faculty development. Likewise, the 11 other competencies which half or more of Engineering Technology faculty needed to develop are not reflected in Figure 1 and should not be overlooked.

Needs of Engineering Technology Faculty Compared to All Faculty.

Twenty-four of the 33 competencies are the same as those needing developed by the majority of all the faculty. The nine additional competencies which half or more of the engineering technology respondents needed to develop were Competencies 40, 50, 1, 16, 51, 33, 24, 49, and 60, six of which were rated Essential by the majority of master teachers.

For the complete set of 66 competencies the mean percent of Moderate to Great need for development ratings was slightly higher for Engineering Technology faculty compared to the mean percent for all the faculty (47.67% vs. 45.71%). Engineering Technology faculty expressed greater needs for development in 38 competencies. The development needs in 15 of these competencies ranged from about 15% to 42% higher than the needs for all the faculty. These 15 competencies are listed below in order of decreasing need for development within each of three ranges of development needs greater than for all the faculty.

Development needs for Engineering Technology Faculty 35% to 42% greater than for all the faculty:

(60) For laboratory/shop courses manage and maintain instruments, equipment and supplies.

(43) Conduct field trips.

(22) Supervise student laboratory experiences.

Development needs for Engineering Technology Faculty 25% to 34.9% greater than for all the faculty:

(64) Up-to-date knowledge and skills in subject area.

(51) Assist students in applying for employment or further education.

(49) Organize laboratories/shops for effective use.

All faculty respondents expressed 15% to only 29.2% greater need for development than Engineering Technology faculty in just eight competencies. These are listed below in order of decreasing need for development within each of two ranges of development needs greater than for Engineering Technology faculty.

Development needs for all faculty 22% to 29.2% greater than for Engineering Technology faculty:

(47) Conduct conferences with students.

(63) Establish and uphold personal professional philosophy including ethical standards.

Development needs for all faculty 15% to 21.9% greater than for Engineering Technology faculty:

(61) Demonstrate appropriate levels of computer literacy and operational and programming skills.

(5) Determine needs of students.

(57) Project future needs for supplies, equipment, books, etc.

(55) Arrange for expanding/renovating facilities.

(26) Lead group discussions.

(42) Present information by using flip charts.

These eight competencies tend to address skills in which most of the faculty, other than engineering technology, might be expected to be less capable, such as Competencies 61, 57 and 55, or deal with competencies that might be of greater interest or concern to other faculty. Two of the eight competencies belonged to each of three Categories: Professional Role and Development, Instructional Management, and Instructional Execution.

Statistically Significant Differences in Responses

Responses to the two questionnaires were subjected to chi-square analyses to check for statistical significance in differences by: (a) discipline clusters, (b) institution size, (c) institution type, (d) geographical area, (e) age, (f) sex, (g) education level, (h) teaching experience, (i) education training, and (j) supervisory status. Additionally, responses by discipline clusters were lumped into two groups, Academic faculty (Arts and Sciences plus Developmental Studies) and Technical faculty (all other disciplines) and referred to as type faculty.

Differences in Importance of the Competencies. Altogether, there were 19 cases of statistically significant differences in responses to importance of the competencies to Tech's master teachers. Most were found by type faculty (8 cases), education level (4 cases), and supervisory status (3 cases). However, since only 19 cases of statistical significance resulted from 693 chi-square analyses (less than what could occur by pure chance at the .05 level, it was not possible to interpret the findings in any meaningful way. The question of differences in importance of the competencies by these factors became almost moot in view of the high level of importance attributed to all 63 competencies.

Differences in Need for Development. A total of 179 cases of statistically significant differences in responses to need for development occurred. Most occurred with respect to differences by discipline areas (47 cases), type faculty (37 cases), sex (18 cases), institution size (18 cases), and length of teaching experience (18 cases). An examination of the levels of need by discipline areas, for competencies where the differences were statistically significant, revealed that in most cases the responses of Arts and Sciences faculty were at the lower extreme of need and Industrial faculty were at the upper extreme. Response of Engineering Technology and other faculty were generally bracketed by those of these two groups.

In other cases of statistically significant differences, males consistently indicated greater need for development than females, larger institution respondents specified lesser need than those from smaller ones, and respondents with more teaching experiences generally expressed less need for development.

Sixty-one cases of significance were identified for the 25 competencies which the majority of all faculty respondents perceived Moderate to Great need to develop. About half of the 61 incidents of significance occurred by discipline areas and type faculty. Most of the remaining incidents were for differences in teaching experience, institution size, and training in education. Plausible explanations for these differences were found in most cases.

Conclusions and Recommendations

The findings of this study indicate that all 66 instruction-related competencies included in this study were perceived to be important to the teaching faculty in the South Carolina Tech System. A number of these competencies needed to be further developed for a large proportion of the faculty, including Engineering Technology faculty.

Administrators and others responsible for planning faculty in-service training and various faculty development activities should give particular attention to the 38 competencies rated Essential by the majority of master teacher re-

spondents as well as the 25 competencies which the majority of respondents indicated Moderate to Great need for development. Engineering Technology administrators should note the competencies that most of their faculty needed to develop. Competencies rated high in both importance and need for development should be considered first in development planning.

There are some noticeable differences in the development needs of Tech's Engineering Technology faculty compared to all the faculty. These variations plus significant differences in the need for development of a number of the competencies for various categories of all faculty respondents indicate that attention should be given and provisions made for such differences, as feasible, in both the preservice preparation of Tech faculty and in their professional development activities.

Particular attention should be given to differences between Academic and Technical faculty and among discipline cluster areas. Furthermore, development of instructional execution (delivery) competencies should be foremost among instruction-related development activities. Development of improved student-oriented human relations competencies should be a major component of in-service and preservice preparation programs.

Noticeable agreement between certain findings of this study and several related studies (for all faculty) conducted in other states and nationally over the past 17 years indicate that some of the findings may be durable over a period of years and be applicable in other parts of the country.

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